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ABSTRACT

A comprehensive theory of instruction is needed that (1) acknowledges the centrality of communication to instruction; (2) recognizes that instruction involves changes in student knowledge, affect, and behavior; and (3) reflects a systematic orientation to instruction. The literature in diffusion, particularly in the area of the communication of innovation, provides a logical step toward meeting this need. The innovation-decision process, change agent characteristics, and attributes of the innovation are three elements affecting the successful communication of an innovation. Each of these elements has implications for instruction. The learning process is a function of stages of the innovation-decision process; teachers are change agents. Further, it is reasonable to suggest that five primary attributes of the diffusion process (complexity, compatibility, observability, relative advantage, and "trialability") are likely to be related to student learning. In fact, preliminary results of a study investigating elements of the diffusion process in an instructional context suggest that the classroom teacher should develop curricula that have specific attributes; curricula should be relatively easy for the student to experiment with, appear to offer an advantage over the student's current knowledge and behavior, have a clearly visible impact on the student, and be relatively easy to understand. (Suggestions are offered for using the communication model in instructional research and applied contexts.) (RH)

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A Communication-Based Theory of Instruction

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A COMMUNICATION - BASED THEORY OF INSTRUCTION

The literature in education is replete with theories of learning to which practicing teachers can turn. Along the same lines, the literature in education features several theories of instruction to which practicing teachers also can turn (e.g. Bruner, 1966; Gagne, 1970; Skinner, 1968). Despite its centrality to the educational process, however, communication is noticeably absent from the conceptual and operational frameworks of the preceding theories. While they convey much to the teacher about the necessary conditions for optimal learning, consequently, they convey only limited amounts of information about how these conditions are best introduced to the teacher's specific situation.

This paper synthesizes earlier work in the development of a communication based theory of instruction and extends this work to their aspects of the instructional environment. In the paper, we suggest that classroom instruction is a unique case of the communication of innovation, and present an instructional model based on this approach.

Learning and Instruction Conceptualized

In the classroom environment, learning has generally been treated as a cognitive process involving the acquisition and assimilation of information (Hurt, Scott and McCroskey, 1978). However, Bloom (1958) conceptualizes

learning as occurring in three domains: cognitive, affective and behavioral. The cognitive domain applies to the recognition and recall of knowledge and the development of intellectual abilities and skills (Bloom, 1968). The affective domain of learning concerns changes in "interest, attitudes, and values and the development of appreciations and adequate adjustment" (Bloom, 1968, p. 3). Learning in the manipulative skill area is the focus of the behavioral domain (Bloom, 1968). Thus, Bloom's conceptualization treats cognition, affect and behavior as independent and unrelated components of learning.

Increasing concern for the relationship between cognitive, affective and behavioral learning has been expressed by a number of educational psychologists (c.f. DeCecco, 1968; Cronbach, 1963; Travers, 1962). Travers (1962), in his discussion of the learning of attitudes, notes that there are three components of learning an attitude: an affective component, a cognitive component, and an action component. Learning in this conceptualization involves the comprehension of information, development of positive or negative feelings about the information, and taking action in accordance with the information. While Traver's discussion is limited to the learning of attitudes, this approach can be expanded to encompass a broader range of learning outcomes. The three components of learning alluded to in Traver's discussion are present in the learning of information and behavior as well as in the learning of attitudes. Bloom (1976), in his more recent work, substantiates this conceptualization, suggesting a strong relationship between congnitve and affective learning. This relationship between cognition, affect and behavior has consistently appeared in the persuasion/attitude change research of the past decades, most recently articulated by Ajzen and Fishbein (1980).

Within the instructional model offered, learning is conceptualized as three integrally related constructs: a cognitive component, an affective component, and a behavioral component. Cognitive learning is defined as exposure to, attention, perception, comprehension and retention of knowledge. Affective learning is viewed as the development of favorable or unfavorable attitudes toward this knowledge. The performance of behaviors that are called for or implied by this knowledge is viewed as behavioral learning. For example, the learning of a conflict-resolution strategy entails the comprehension of information about that strategy, the development of favorable or unfavorable attitudes toward the strategy and the performance of conflict resolution behavior. Arranging the conditions to facilitite this learning process is the process of instruction (Srelbecker, 1974).

Instruction is defined as a systemic, communication process directed toward changes in student knowledge, attitudes and/or behavior (learning). Any explanation of classroom instruction must acknowledge that the instructional process is systemic. Instruction is systemic in as much as it involves a set of organized, interdependent components (teacher, content, student, etc.) with a specific goal or function (facilitating learning). Through the mutual interaction of the elements in this instructional system, cognitive, affective, and behavioral learning goals are accomplished.

Communication is central to the instructional process in as much as it is the vehicle through which change occurs in the classroom. The interaction of teacher and student and the variables within the instrucional environment affecting this interaction underly classroom instruction. As Rogers and Adhikarya (1979) point out "the purpose of communication is to bring about certain desired effects on the part of the receiver; alteration of the

received knowledge of some idea, a change in attitude toward the idea, or a change in his overt behavior."

Clearly what is needed is a comprehensive theory of instruction that (1) acknowledges that communication is central to instruction, (2) recognizes that instruction involves changes in student knowledge, affect and behavior, and (3) reflects a systemic orientation to instruction. The literature in diffusion, particularly the work of Rogers and Shoemaker (1971) in the communication of innovation, provides a logical step in this direction. The viability of the communication of innovation model in educational settings is well substantiated, (c.f., Rogers and Shoemaker, 1971; Havelock, 1970; Huberman, 1973); however, it is only rcently that this approach has been applied within the confines of the classroom.

Communication of innovation concerns the adoption or rejection of innovations by individuals (Rogers and Shoemaker, 1971). Innovation refers to "an idea, practice or object perceived as new by an individual" (Rogers and Shoemaker, 1971, p. 19). In effect, the process undergone by a student in the classroom is the adoption of an innovation. Students are repeatedly called upon to accept new ideas or practices within the instructional setting. Rogers and Shoemaker (1971) note that the principles of the diffusion of innovation at the individual level have often been termed learning. Morover, Rogers and Adhikarya (1979) assert that: "The learning process, the diffusion process and the change process basically involve the communication of new ideas" (p. 69).

The application of the communication of innovation model to the instructional setting is depicted below. The elements depicted are described in detail in the remaining sections of the paper.

Insert Figure 1 Here

The success or failure of any diffusion effort is dependent upon a number of elements within the diffusion process. Among the primary elements affecting the sucessful communication of an innovation are:

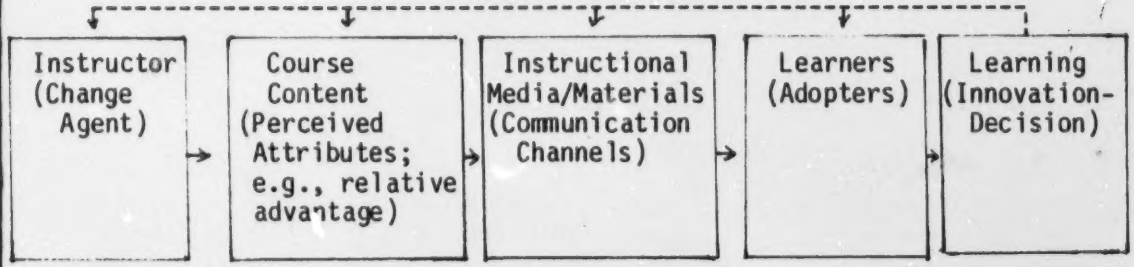
- o innovation - decision process
- o change agent characteristics
- o attributes of the innovation

These three areas and their role within the instructional environment are described below.

Learning As An Innovation-Decision Process

Similarities between the diffusion paradigm and learning paradigm are evident elsewhere. The learning process is essentially a function of the first three stages of the innovation-decision process. The innovation--decision process refers to "the mental process through which an individual passes from first knowledge of an innovation, to a decision to adopt or reject and to confirmation of this decision" (Rogers and Shoemaker, 1971, p. 25). The first function of the innovation decision process, knowledge, is represented by cognitive learning. Rogers and Shoemaker (1971) conceptualized the knowledge function as "an individual's exposure to information about an innovation and gaining understanding of how it functions" (p. 25). This closely approximates the conceptualization of cognitive learning articulated earlier, although Rogers and Shoemaker note that deeper seated knowledge associated with an innovation is likely to come later in the innovation

COMMUNICATION OF INNOVATION
MODEL OF INSTRUCTION



_____ Primary Path

------ Secondary Effects

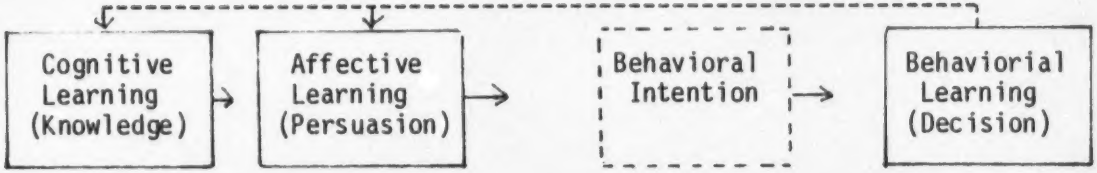
decision process. Persuasion, the second function discussed by Rogers and Shoemaker (1971), involves the formation of favorable or unfavorable attitudes toward the innovation. This, too, is isomorphic with the definition of affective learning offered earlier. The third function of the innovation decision process, decision, is closely alligned with behaviroal learning. The individual's choice to adopt or reject the innovation is the focus of concern in the decision function (Rogers and Shoemaker, 1971). Adoption or rejection of behaviors in line with knowledge given is present within both the decision process and behavioral learning. Consitent with Ajzen and Fishbein's (1980) conceptualization of the attitude-behavior relationship we would argue that the persuasion-decision relationship is mediated by behavioral intent. Conceptual similarity between the two processes clearly indicate that learning can be considered to be a unique case of the communication of innovation.

Insert Figure 2 Here

Change Agent Characteristics

Central to the communication of innovation paradigm is the role of the change agent. Rogers and Shoemaker (1971) indicate that the role of the change agent is to bring about "overt behavior change, that is the adoption or rejection of new ideas rather than just changes in knowledge or attitudes" (p.13). The teacher, in essence, is a change agent within the unique context of the instructional setting. In the classroom situation we generally find the teacher introducing ideas and practices that are not only unfamiliar to the student, but also aimed at bringing aout changes in the student's behavior, knowledge, and attidudes.

INNOVATION - DECISION PROCESS
MODEL OF LEARNING



_____ Primary Path

------- Subsequent Effects

One of the most important aspects of change agent behavior is the relationship between the change agent and the adopter. Homophily, or the degree to which pairs of individuals who interact are similar in certain attributes such as beliefs, attitudes, values, education and social status, plays a significant role in the diffusion of innovation (Rogers and Shoemaker, 1971). Research clearly indicates that more effective communication occurs between individuals that are homophilous (Alpert and Anderson, 1973; Rogers and Shoemaker, 1971; Rogers and Bhowmik, 1970). Rogers and Bhowmik (1970) maintian that "communication is effective when the transfer of an idea from a source to a receiver results in change in knowledge, attitude or overt behavior on the part of the receiver: (p. 529). A variety of studies have confirmed these assertions (Brock, 1965; Byrne, Bond, and Diamond, 1969; King and Sereno, 1973) While homophily has been shown to be an important communication element in a variety of settings, Rogers and Shoemaker (1971) note that these desired effects may be negated if source and receiver are too homophilous.

A number of scholars have suggested that moderate dissimilarity along a few selected dimensions of homophily increases communication effectiveness, and consequently the success of the communication of innovation (Scott and Hurt, 1978; Alpert and Andersen, 1973; King and Sereno, 1973). Research suggests that more effective change agents are those who are most like their average client on all variables except for technical competence about the innovation promoted (Rogers and Shoemaker, 1971; Rogers and Bhowmik, 1970). This concept is referred to by Rogers and Shoemaker (1971) as optimal heterophily. Research findings have repeatedly reaffirmed this relationship as the ideal condition for the communication of innovation (Simons, Berkowitz and

Moyer, 1970; Alpert and Anderson, 1973; Richmond 1974; Scott and Hurt, 1977) Research clearly supports the significance of optimal heterophily in the diffusion of innovation.

The important role of homophily and optimal heterophily in the instructional setting has been verified by Elliot and Scott (1978). Their findings indicate that the most effective instructional outcomes are produced when teacher and student are similar along most dimensions and moderately dissimilar in terms of competence (Elliot and Scott, 1978).

Course Content Attributes

Rogers and Shoemaker (1971) suggest that five primary attributes of an innovation are related to the adoption of the innovation within a social system--complexity, compatibility, observability, relative advantage, and trialability. Complexity refers to "the degree to which an innovation is perceived as relatively difficult to understand and use" (Rogers and Shoemaker, 1971, p. 154). (Rogers and Shoemaker, 1971, p. 145) is the focus of compatability. Observability references "the degree to which the results of an innovation are visible to others" (Rogers and Shoemaker, 1971, p. 138). The conceptualization of trialability centers around "the degree to which an innovation may be experimented with on a limited basis." (Rogers and Shoemaker, 1971, p. 155).

Although Rogers' and Shoemakers' (1971) conclusions regarding the role of these attributes in the diffusion process are based primarily on the literature in rural sociology, it seems reasonable to suggest that the complexity, compatibility, observatility, relative advantage, and trialability of

instructional content will significantly influence the extent to which the student will comprehend the content, the extent to which the student will develop a favorable attitude toward the content and the extent to which the student will engage in behaviors that are called for or implied by the content.

Rogers and Shoemaker (1971) suggest that the complexity of an innovation is negatively related to its rate of adoption. Similarly, we would expect that course content that is both difficult to understand and to put into practice would result in lower rates of learning. In other words, the complexity of course content, as perceived by the student, should be negatively related to student learning.

Rogers and Shoemaker (1971) suggest that compatability is positively related to an innovation's rate of adoption. The more compatible an innovation is with an individual's values and beliefs, past experiences, and personal needs, the more likely the individual is to adopt the innovation. A similar relationship can be anticipated within the classroom. The greater the extent to which course content reflects the student's values and beliefs and needs and is consistent with previous knowledge or experience in the content area, the more receptive the student will be to the course content. The compatibility of course content, as perceived by the student, is positively related to student learning.

Observability is reported to be positiviely related to an innovation's rate of adoption by Rogers and Shoemaker (1971). Based on prior research in this area, we believe that ideas which are more easily observed and communicated are more likely to be adopted by members of a social system. Within the classroom, observability would be expected to play a role as well. The

extent to which the student can observe the results of his/her efforts in the course (both within the classroom and outside the classroom) would be reflected in the amount of learning occuring. The observability of course content, as perceived by the student, should be positively related to student learning.

Among the other key attributes of innovations reported by Rogers and Shoemaker (1971) to effect the rate of adoption is relative advantage. They maintain that the extent to which an innovation is judged to be more desirable than the idea which it replaces is positively related to its rate of adoption. Similarly, the student in the classroom setting forms perceptions of the relative advantage of the course content. The student is engaged in a process of deciding whether the material taught is more desirable than previously held information on the subject, or in many cases, whether learning the material is more desirable, given the effort of attending school, than having no knowledge of the course content. The relative advantage of course content, as perceived by the student, should be positively related to student learning.

Rogers and Shoemaker (1971) submit that the trialability of an innovation can significantly affect its rate of adoption. Rogers and Shoemaker (1971) suggest than an innovation that is triable is less risky to the adopter since one need not to engage in full-scale adoption of the innovation immediately. Similarly, course content that includes specific skills, or implies certain practices than an be experimented with at minimal risk should be more readily learned by the student. That is, trialability of course content, as perceived by the student, should be positively related to student learning is positively related to student learning.

Elliot and Scott (1982) investigated these course content attributes within the instructional environment, and, in part, substantiated their importance to instruction. While we found them to be of importance within this environment, we found that the distinction between the five attributes as presented by Rogers and Shoemaker (1971) breaks downs within the instructional setting to three dimensions. - Relative advantage/Observability, Trialability, and Complexity - with compatibility failing to emerge as important. As a note of caution: one study doth not truth make. Methodological problems (e.g., low variance and the selection of an unusual instructional environment) bring these results into question.

However, our preliminary findings suggest the classroom instructor should concentrate on developing a course curriculum which:

(a) is relatively easy for the student to experiment with;

(b) appears to offer an advantage over the student's current knowledge /behavior and;

(c) has a clearly visible impact on the student.

(d) and is relatively easily understood.

Discussion

This paper discusses some of the key elements of the instructional environment and the need for a comprehensive theory to explain and predict behaviors and outcomes within this environment. It is agrued that communiation scholars are uniquely suited to this task because of the centrality of communication to instruction. In line with this notion, we presented our work in the development of a communication based theory of instruction drawing from the literature in the communication of innovation.

While the theoretical framework presented have been well substantiated in a variety of change effort environments, there is only limited empirical support for many of the elements within the Rogers and Shoemaker (1971) model within the classroom environment. Although it is fully anticipated that those elements within the model that have to date remained untested within the classroom will be substantiated within this setting, this remains an empirical question. Considerable work has been done toward this end already; however, this area is rich for research. We recommend that future research exploring this communication-based theory of instruction focus on the following elements that have to date received limited attention:

- instructional media
- learner (adopter) characteristics
- teacher (change agent)-student (adopter) relationship

Moreover, we would recommend that the elements within this instructional approach be examined employing experimental designs; while much of the elements within the model have been explored, research has been, For the most part, limited to correlational designs. Future research efforts should investigate the elements discussed within carefully controlled experimental designs to substantiate the causal relationships posited.

In additional to the general research directions offered, we recommend that the research efforts directed toward the end of validating this instructional model should be multivariate designs. Among the aspects of this model that we emphasized in this paper is the notion that communication in the

classroom is systemic. While certainly not a new or shocking suggestion, there appears to be a gap between the conceptual argument for a systemic approach and the research that follows. Clearly, if we are to substantiate the systemic character of instructional interaction, our research models must be oriented in this direction.

It is hoped that the instructional theory offered will not only provide a rich source for further investigation of instructional phenomena, but that it will also provide a useful model for the practitioner. We have found (and have heard similar reports from our colleagues) that this model offers a useful approach for the design and instruction of college courses. To our knowledge, direct application of the model has been limited to communication courses. We would expect that application of the model to other content areas within elementary, secondary and college level curriculum would be as successful (if not more successful) than within communication courses. Within curriculum areas in which specific behaviors are called for (e.g., biology lab course, physical education) we expect the greatest application; the model is oriented toward behavior change, and as such is likely to be most adoptable to this type of instructional content. Similarly, using this approach within industrial/corporate training (as opposed to traditional education), where the instruction of specific behaviors is the primary goal, is likely to meet with great success.

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